

D & D SUBGROUP HIGHLIGHTS  
December 7, 1999

This meeting was held in the EESB, Chinook Room. The meeting began at 8:00 a.m.

This special meeting was attended by members of the Nuclear Materials Focus Area (NMFA) and was devoted to learning about the NMFA and discussing some of our nuclear material needs with the visitors.

Bob Seidel, The NMFA Technical Manager, gave a viewgraph presentation that included an overview of the NMFA and information on the needs validation process and in particular how Hanford's needs may fit into the NMFA scope. Bob stated that as a new focus area the group was here to learn who was who at Hanford and what we are doing as well as to tell us about the new NMFA and what they plan on doing. EM-50 is pursuing investments that are arrived at using a credible decision process and are solution-driven, comprehensive in scope and fully integrated across the DOE Complex. The NMFA is one of five focus areas that, combined with the EMSP and the cross-cutting focus areas, are integrated at EM-50. The NMFA has \$400K of funding this FY but is expecting more in future years.

Bob presented a chart that showed the evolution of nuclear materials R&D within DOE-EM. The NMFA began in April 1999 and was based on the old Pu Focus Area. There are also two other groups or efforts underway: the 94-1 R&D program and the NM Stewardship Project office. The scope of the NMFA includes nuclear materials "owned" by DOE-RM, nuclear materials owned by other programs but stored in EM facilities, and materials expected to be transferred to EM control by 2015. These materials include TRU isotopes, uranium/thorium, and non-actinide isotopes and sealed sources. The scope includes nuclear materials that are not currently waste. Many of these materials are in programmatic use, have nonproliferation/arms control requirements, and are classified. Long-term storage and safety issues are the key drivers for R&D priorities. The NMFA is headquartered at DOE-AI and DOE-ID but will interface with all the DOE labs, sites and programs to integrate the needs, develop solutions, and deploy technology. There were 70 needs, at 8 sites, identified as nuclear material needs. Hanford has seven needs identified from the S&T FY99 needs submitted through the STCG review process. Bob wants to strengthen the process of needs identification this year.

The NMFA has four thrust areas they are working in: stabilization, packaging/storage, materials processing and long-term storage issues. For all four of these thrust areas the benefits or impacts of solving the problems include meeting DNFSB milestones, satisfying local agreements with regulators, and enabling site and facility closures. In the stabilization area the problem is that there are large quantities of nuclear materials in the DOE complex in a variety of chemical and physical forms that are unsuitable for long-term storage or disposition. The two research areas to help solve this problem that the NMFA is focussing on are the measurement of moisture in residues and the removal of Pu contamination from the material. In the packaging/storage thrust area the problem is that there is not an adequate technical basis for the transportation and interim storage of the

wide range of nuclear materials in the complex. The two research areas that the NMFA is focusing on are studies and models of gas generation in the transportation/storage container and the automated handling of the materials. In the materials processing area the NMFA is developing alternatives to traditional processing techniques within stakeholder constraints. Included in this is research on separation of Pu from U, conversion of classified shapes, Pu surface decontamination, and aqueous processing of CI residues.

In the area of long-term storage the problems revolve around long-term safety and the numerous technical challenges this presents. Two research areas the NMFA is dealing with are the corrosion of the storage containers and the design of vacuum transfer systems to move large quantities of materials from current storage containers to transportation containers for disposal. The NMFA identified four areas of activity at Hanford that they are interested in helping with: moisture measurement in contaminated materials, gas generation in transportation and storage, detection of moisture and hydrides, and Cs storage and monitoring. PNNL was shown to be the primary materials lab for Cs/Sr research for the NMFA and a contributing process lab for requirements, standards, stabilization, and HLW research. Bob mentioned that the NMFA may be looking at Spent Nuclear Fuel (SNF) as part of the scope of the NMFA.

The last half of Bob's presentation focused on the process that the NMFA is using to prioritize needs across the DOE Complex and in particular how the NMFA sees Hanford's needs fitting into their product lines. Five steps in the NMFA process were shown: update status (including site needs); validate needs, requirements & technologies; prioritize work; execute the projects; and then deploy successful technologies. Bob reviewed the weighting system used to prioritize the work packages in the NMFA product lines. Some of the highest values were applied to site S&T needs and technological risk. Bob then reviewed the seven product lines that the NMFA has put the work packages into. Some of Hanford's disposition maps for various materials were shown and discussed including highly enriched uranium and beta/gamma materials. Bob then reviewed eleven NMFA work packages that Hanford's needs were mapped into or that may include our needs in the future. Each of these needs was discussed and some Mixed Waste and D&D needs were also mapped into the NMFA work packages. In particular some of the Spent Nuclear Fuel needs that Hanford identified were highlighted by Bob as fitting into the work package for Spent Fuel Technologies.

The next step in the NMFA process includes reviewing the current and suggested needs for Hanford with the program individuals which will start during this visit. In mid-January 2000 the NMFA will certify concurrence of needs by end-users, STCG's, and the PBS managers. After the concurrence the information will be entered and linked into EM-50 databases and the PBS. The NMFA work packages will then be revised to reflect current information and to address highest priority needs. The NMFA will then propose a FY 2002 budget and begin defining requirements for FY 2001 projects. The RFPs for FY2001 will be out in June and funding awarded in the October/November timeframe. This will be done through FETC. RFIs will go out before the RFPs. In February 2000 the NMFA will have a kickoff meeting. Bob was not sure how science needs will be met or the funding

amounts that are available for NMFA projects. Some applied science needs may be funded by the focus areas but most funding will be for development rather than demonstrations. The NMFA has a web site and the address is <http://id.inel.gov/nmfa/>.

Mark Gibson presented information to the NMFA on the overall site organization including the DOE-RL and ORP offices and how the contractor organizations are set up. Greg Berlin then gave an overview of the S&T needs process and how the STCG was involved in determining the 200 needs at Hanford. Greg stated that there were four specific NM needs identified in the needs process but that some of the SNF, MW, and WESF needs may fit into the new NMFA scope of operations. Bob stated that Hanford should try to get any other or new needs to the NMFA by the end of January. Greg stated that the rest of the day as well as part of tomorrow will be spent reviewing in detail the Hanford needs that the NMFA may help us solve.

Bruce Makenas gave a viewgraph presentation on the Hanford SNF technology needs. Due to the short time frame, there is not much that can be done for the SNF itself but there are needs associated with the sludge, the clean up of the basins and the long term monitoring of the stored fuel. In addition to the N-Reactor fuel in the K-Basins there are other fuels on-site including FFTF, TRIGA and Shippingport fuels. The major focus right now is the K-Basins work due to the proximity to the Columbia River. Most spent fuel will be heading to dry storage in the 200 Area and eventually to a repository. The K-Basin fuel is to be completely moved to interim storage by December 2003, the sludge removed from the basins by August 2004 and the basin completely clear of all contamination and material by July 2007. Bruce showed pictures of the stored fuel in canisters and of one rod being removed from a canister. The photos showed the degradation of some of the rods and the point was that the sludge in the basins will contain pieces of the fuel rods. Bruce showed a line diagram of the K-Basins and reviewed the key features of the basins. A photo of sludge trailing behind a fuel element as it was removed from a canister was then shown to highlight the problem of sludge in the basins.

Bruce reviewed the Hanford SNF needs that fall into four categories: fuel storage, debris removal, basin wall decontamination, and sludge. The first category, fuel storage needs, is concerned with how to monitor the multi-canister overpacks (MCOs) that will hold the SNF after removal from the K-Basins. There is an MCO design being demonstrated now but there may be a need to interrogate the MCOs as to their internal status in the future. Only a small number of MCOs will be set aside for closer monitoring over the first few years. If there is still a need we will need to rewrite and revise the current need. The debris removal need involves the capture and immobilization of minute debris. This would be more of a DDFA oriented need rather than the NMFA. The basin wall decontamination needs are to map the contaminants, decon the concrete walls, and examine the use of fixatives. These also are DDFA related needs rather than NMFA. The sludge need is for processing the sludge at some time in the future. The current plan is to store the sludge in canisters in a wet condition. There may be a need for monitoring these interim canisters. This need will be revised soon. In the long run there is a need for a repository loading and shipping station for SNF and glass after 2010. In addition the SNF may need to be prepared for shipment to the repository. Also there may be a need for shipment and

treatment of sodium bonded FFTF fuel. Bruce also presented the three SNF Technology Insertion Points.

Larbi Bounini reported on one MW need that deals with twelve drums of Pu-238 waste that are now buried in trenches. These are metal scraps and contain no organics. There is a need to identify what to do with these drums to meet the TPA milestone (M-91) that requires a June report. The NMFA will provide technical support on this problem.

D&D Subgroup Meeting Attendees 12/07/99

Harry Bell	DOE-RL	376-2347
Greg Berlin	FDH -TM	372-4352
Bill Bonner	PNNL	372-6263
Larbi Bounini	WMH	376-4650
Jim Buelt	PNNL	375-4315
Clark Carlson	PNNL	376-4327
Tom Frater	FDH	372-4291
Glen Fryxell	PNNL	375-3856
Suzanne Garrett	PNNL	372-4266
Mark Gibson	FDH	373-4869
Dieter Knecht	INEEL	(208) 526-3627
Kim Koegler	BHI	372-9294
Charles Kronvall	FDH	376-9601
Dave Langstaff	DOE-RL	376-5580
Bruce Makenas	FDH	376-5447
Tina Masterson-Heggen	Ecology	736-5701
Gary Polansky	SNL	(505) 845-7029
Roger Pressentin	DOE	376-1291
Virginia Randall	INEEL	(208) 526-5205
Bob Seidel	INEEL	(208) 526-2769
Kurt Silvers	PNNL	372-4828
Jim Slougher	FDH	375-2413
Rich Szempruch	FDH	373-1468
Ted Venetz	FDH	376-9669
Terry Walton	FDH	372-4548
Steve Weakley	PNNL	372-4275
Detlev Wegener	FDH-HAMMER	373-2021
Wally Weimer	PNNL	376-3995